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⑮ 発明の名称 半導体装置の製造方法

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明 細 書

発明の名称 半導体装置の製造方法

特許請求の範囲

半導体表面の熱酸化膜形成工程において、酸素と水素の混合雰囲気中で熱処理した後、酸素雰囲気中で熱処理を行うことを特徴とする半導体装置の製造方法。

発明の詳細な説明

産業上の利用分野

本発明は、シリコンMOS構造を有する半導体装置の製造方法、特にそのゲート酸化膜の製造方法に関する。

背景技術とその問題点

シリコンMOS半導体装置のゲート酸化膜の形成方法には、大別してウェット酸化法とドライ酸化法の2通りがある。また、これらの改良法として、 HCl を導入したもの、 O_2 を N_2 で希釈したもの、 HCl 2ステップ酸化法などがあるが、それぞれ一長一短がある。通常得られたゲート酸化膜に要求される特性は、不純物汚染及び欠陥が少なく、且つト

ラップ単位密度が少ないことである。また、製造上は、酸化膜の形成が容易であり、制御性が良いことも要求される。第1図に直径3インチのN形シリコンウエハにドライ酸化法で O_2 を70分間流して熱処理することにより219Å厚の酸化膜を形成した後、370個分のチップについて耐圧不良の頻度を測定した結果を示す。第1図において、このように初期耐圧不良(降伏電圧 V_{BD} が1~3Vのところ)チップが多いのは、ドライ酸化法により薄い酸化膜を形成した場合、ピンホール又は直径10Å位のマイクロボアと呼ばれる欠陥がチップに生じていることによる。一般に、ドライ酸化法によるとウェット酸化法と比べて、耐圧不良のチップが多く生じるという欠点がある。 HCl を導入した改良ドライ酸化法で、 HCl が3%以下、処理温度が1100℃以上の場合、トラップ単位密度が少なく且つ耐圧分布の良いチップが得られる。しかし、このような条件下では、酸化速度が早すぎて制御が困難になるという問題点が伴う。一方、ウェット酸化法で得られるチップは、耐圧分布が優れて

(1)

(2)

いるため、200 Å水準のゲート酸化膜としては好適である。しかし、このウェット酸化法は、発熱的であり、 H_2 ガスを用いるため、900℃より下では使用できない。また、酸化速度が900℃でもかなり早い(10分間で200 Å)ため、200 Åより薄い酸化膜を形成する場合には膜厚の制御が困難になるという問題点がある。

発明の目的

本発明は、上述の点に鑑みて、酸化膜の初期耐圧不良の頻度を減少させることができ、且つ酸化膜厚の制御が容易な半導体装置の製造方法を提供するものである。

発明の概要

本発明は、半導体表面の熱酸化膜形成工程において、酸素と水素の混合雰囲気中で熱処理した後、酸素雰囲気中で熱処理することを特徴とする半導体装置の製造方法である。

上記製造方法により、熱酸化膜の初期耐圧不良の頻度を減少させることができる。また、本発明によれば、酸化膜厚の制御が容易になる。

(3)

対照として、従来のウェット酸化法に基づき O_2 と H_2 の混合気体を9分間流して194 Å厚の熱酸化膜を形成し、このウェハについて耐圧不良の頻度を測定した結果を第4図に示す。このように、従来のウェット酸化法によつても、熱酸化膜の初期耐圧不良の頻度は減少する。しかし、この従来法と本発明とを酸化膜厚の制御性の点で比較すると次のような相違がある。

第2実施例の酸化法で熱酸化膜の膜厚を時間の経過とともに測定した結果を第6図の曲線Xに示す。この曲線Xで点OA間は、酸化膜厚が時間に比例する領域である。点A以降は時間の平方根に比例し($\propto t^{\frac{1}{2}}$)、点Bで O_2 のみに切り替えると比例係数が小さくなつて酸化速度は遅くなる。点C以降においては、 N_2 に切り替えられるので、膜厚は一定値をとる。このように本発明によれば、 O_2 のみに切り替えた後、酸化膜は30分間という長い時間をかけて所定の厚さに緩やかに成長する。これに対して、上記従来のウェット酸化法(O_2 と H_2 の混合気体のみを使用)による場合、第6図の曲

(5)

実施例

以下の実施例においては、直径3インチのN形Siウェハに200 Å水準のゲート酸化膜を形成する方法について説明する。

第1の実施例では、最初の1分間 O_2 が3 L/分と H_2 が3 L/分の混合気体を流しながら熱処理した後、 O_2 のみを3.6 L/分で51分間流して熱処理し、次に N_2 のような不活性ガスを所定時間流して193 Å厚の熱酸化膜を形成した。このウェハに370個のチップを形成し、熱酸化膜の耐圧不良の頻度を測定した結果を第2図に示す。

第2の実施例では、最初の3分間 O_2 が3 L/分と H_2 が3 L/分の混合気体を流しながら熱処理した後、 O_2 のみを3.6 L/分で30分間流して熱処理し、次に N_2 を所定時間流して180 Å厚の熱酸化膜を形成した。このウェハについて、上記第1実施例と同様に熱酸化膜の耐圧不良の頻度を測定した結果を第3図に示す。上記2実施例より、本発明によれば熱酸化膜の初期耐圧不良の頻度を減少させることができる。

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図Yに示すように、9分間という短時間で200 Åの膜厚に成長する。即ち、両曲線X及びYを比較して明らかな通り、酸化膜厚の制御性の点で本発明の方がウェット酸化法より優れている。

上記実施例は、 O_2 と H_2 の混合気体を1～3分間と短時間流した場合であるが、本実施例においては最初にこの混合気体を10秒間流した後、 O_2 のみを51分間流して熱処理し、179 Åの熱酸化膜を形成した。このウェハについて、上記実施例と同様に熱酸化膜の耐圧不良の頻度を測定した結果を第5図に示す。

このように混合気体による熱処理時間が短い場合であつても、次に O_2 のみを流して熱処理を行うことにより熱酸化膜の初期耐圧不良の頻度を減少させることができる。

なお、第1図～第6図において矢印は同じ電界強度(8MV/cm)であることを示す。

発明の効果

本発明によれば、熱酸化膜にピンホール又はマイクロボアのような欠陥が生じないため、初期耐

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圧不良の発生が減少する。また、酸素と水素の混合気体による処理時間と酸素のみによる処理時間との割合を調整することにより、酸化時間を適当な長さに設定することができるため、特に薄い酸化膜厚の制御が容易である。

図面の簡単な説明

第1図はドライ酸化法により熱酸化膜を形成したウエハのチップについて耐圧不良の頻度を測定したグラフ、第2図、第3図及び第5図は本発明により熱酸化膜を形成したウエハのチップについて耐圧不良の頻度を測定したグラフ、第4図はウェット酸化法により熱酸化膜を形成したウエハのチップについて耐圧不良の頻度を測定したグラフ、第6図は本発明の酸化法及びウェット酸化法による酸化膜厚の成長状態を示すグラフである。

代理人

伊藤

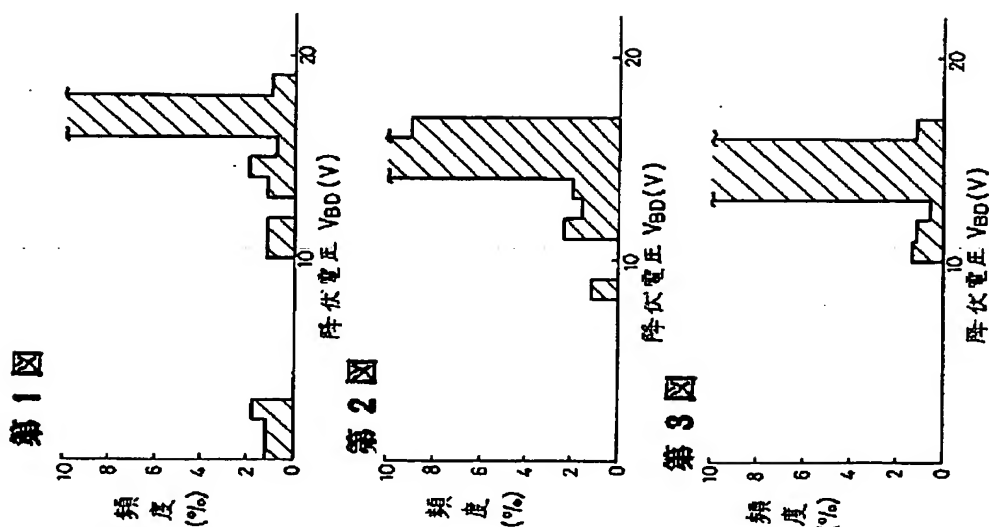
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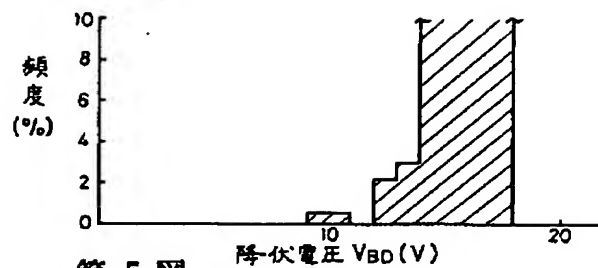
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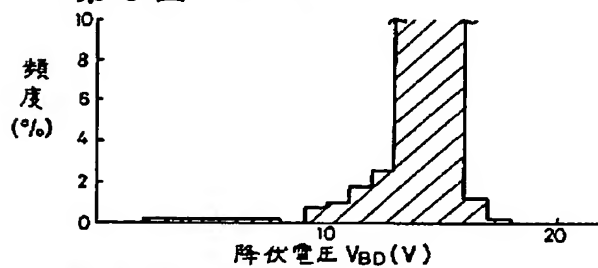
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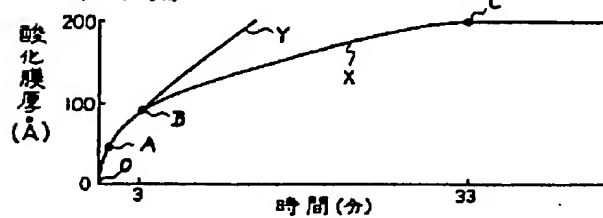
第4図



第5図



第6図



平成 3. 4. 26 発行

手続補正書

特許法第17条の2の規定による補正の掲載

平 3. 4. 26 発行

昭和 59 年特許願第 86754 号(特開昭
60-231365 号, 昭和 60 年 11 月 16 日
発行 公開特許公報 60-2314 号掲載)につ
いては特許法第17条の2の規定による補正があっ
たので下記のとおり掲載する。 7 (2)

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特許庁長官 植 松 敏 昭



1. 事件の表示

昭和 59 年 特 許 願 第 8 6 7 5 4 号

2. 発明の名称

半導体装置の製造方法

3. 補正をする者

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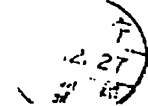


5. 補正命令の日付 平成 年 月 日

6. 補正により増加する発明の数

7. 補正の対象 明細書の発明の詳細な説明の欄。

8. 補正の内容



- (1) 明細書中、第 2 頁 19 行「困難してなる」とあるを「困難になる」に訂正する。
- (2) 同、第 3 頁 2 行～3 行「発熱的であり、」とあるを「燃焼式で」に訂正する。
- (3) 同、第 6 頁 12 行～14 行「このように………行うことにより」とあるを「このように混合気体による短い熱処理時間の次に」のみを流して熱処理を行うことによっても」に訂正する。

以 上

PATENT ABSTRACTS OF JAPAN

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(21)Application number : 59-086754

(71)Applicant : SONY CORP

(22)Date of filing : 27.04.1984

(72)Inventor : NAKAMURA YASUO

(54) MANUFACTURE OF SEMICONDUCTOR DEVICE

(57)Abstract:

PURPOSE: To decrease the frequency of the occurrence of the poor withstand voltage at the initial stage in a gate oxide film in a silicon MOS semiconductor device and to facilitate the control of the thickness of the oxide film, by performing heat treatment in the mixed atmosphere of oxygen and hydrogen, and thereafter performing heat treatment in an oxygen atmosphere.

CONSTITUTION: In the process of forming a thermal oxide film on the surface of a semiconductor, heat treatment is performed in the mixed atmosphere of oxygen and hydrogen. Then, heat treatment is performed in an oxygen atmosphere. For example, the mixed gas including 3l/min of O₂ and 3l/min of H₂ is made to flow for the initial 3min, and the heat treatment is performed. Then only O₂ is made to flow at a rate of 3.6l/min for 30min. Thereafter N₂ is made to flow for a specified time. Thus a thermal oxide film is formed. A gate oxide film is formed on an Si wafer. Defects such as pinholes or micropores are not yielded in the thermal oxide film. Therefore, the occurrence of the poor withstand voltage at the initial stage is decreased. The rate of the treating time by the mixed gas of the oxygen and the hydrogen and the treating time of only the oxygen is adjusted. Thus the oxidizing time can be set at a suitable length. Especially, the control of the thickness of the thin oxide film becomes easy.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

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[Number of appeal against examiner's decision of rejection]

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[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] Metallic foil (1) Sensible-heat adhesives layer containing the sensible-heat adhesive property resin 50 which use at least one side as a principal component at one side among the partial saponification object of an ethylene-vinyl acetate copolymer, and its acid denaturation object - 98 weight sections, rosin 1 - 40 weight sections, and the higher-fatty-acid amide 0.1 - 10 weight sections (2) Heat seal lid material of the container for a seal package prepare.

[Claim 2] Metallic foil (1) One side and sensible-heat adhesives layer (2) It is a middle resin layer (5) in between. It is prepared and is a middle resin layer (5). Heat seal lid material of the container for a seal package according to claim 1 which is what consists of a film which uses polyethylene or its copolymer as a principal component.

[Claim 3] Metallic foil (1) It is aluminium foil with a thickness of 5-100 micrometers, and is a middle resin layer (5). The film which uses the polyethylene to constitute or its copolymer as a principal component has 10-50 micrometers in thickness, and is a sensible-heat adhesives layer (2). Thickness 1-10g/m² Heat seal lid material of the container for a seal package according to claim 2 which is what it has.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the heat seal lid material used for the container for a seal package made of synthetic resin.

[0002] Here, the container for a seal package made of synthetic resin shall mean the polyethylene container for a seal package, a polypropylene container, a polystyrene container, or the paper carton of a polyethylene coat.

[0003]

[Description of the Prior Art] With development of a package technique, the container made of the above-mentioned synthetic resin is filled up with various chemicals and an eating-and-drinking article, they are packed more often in recent years, and, in such a case, the demand of being able to open easily not only at the sealing performance of a container but the time of use has increased very much.

[0004]

[Problem(s) to be Solved by the Invention] However, when opening nature was improved, when heat adhesion of lid material and the body of a container was carried out by high temperature, after being filled up with contents, the temperature rise of the head space of a seal object occurred, internal pressure rose and there was a problem that heat jointing separated. Furthermore, in the case of the heat restoration method which carries out restoration seal, this problem tended to generate the heat-sterilized food etc. in a container in **** (80 degrees C or more) of a heating condition as contents.

[0005] Then, although peeling of heat jointing was conventionally prevented at the sacrifice of opening nature so to speak in order to satisfy the sealing function of a container, there was a problem of being imperfect.

[0006] When the purpose of this invention solves the problem of the above-mentioned conventional technique and contents are filled up with and sealed at a container, The exfoliation force committed by internal pressure rise of a seal object to a heat-sealing side can be borne enough, and it has the outstanding sealing performance. Moreover, at the time of opening By the moderate force, it can tear off easily and is in offering the heat seal lid material of the container for a seal package equipped with both the functions of sealing performance and easy PIRU nature.

[0007]

[Means for Solving the Problem] The sensible-heat adhesive property resin 50 which uses at least one side as a principal component at one side of a metallic foil among the partial saponification object of an ethylene-vinyl acetate copolymer, and its acid denaturation object in order that this invention may attain the above-mentioned purpose - 98 weight sections, The heat seal lid material of the container for a seal package with which the sensible-heat adhesives layer containing rosin 1 - 40 weight sections, and the higher-fatty-acid amide 0.1 - 10 weight sections is prepared is made into the summary.

[0008] Although aluminium foil is usually used for the above-mentioned metallic foil, they may be other metallic foils. In the case of aluminium foil, 5-100 micrometers of the thickness are 5-50 micrometers preferably. Moreover, it is desirable to set thickness of aluminium foil to 15-50 micrometers, when fabricating the so-called skirt-board section (hem part) for lid material after a seal or in front of a seal, when not fabricating the skirt-board section, aluminium foil may be made thin and the reinforcement of lamination and the lid material itself may be given to one side for polyester film etc.

[0009] In addition, if a metallic foil is used as a base material of heat seal lid material, it excels in barrier nature and preservation of contents, such as desserts and precooked food, can be achieved effectively for a long period of time.

[0010] The partial saponification object (it is hereafter called HEVA for short) or (reaching) its acid denaturation object (it is hereafter called HEVA-C for short) of an ethylene vinyl acetate copolymer is first explained among the constituents of the above-mentioned sensible-heat adhesives layer.

[0011] Although a vinyl acetate content uses what is 19 - 45 % of the weight as an ethylene vinyl acetate copolymer (EVA) used as the raw material at the time of manufacturing these components, 25 - 40% of the weight of a thing is used still more preferably. EVA of such a vinyl acetate content is manufactured according to a well-known manufacturing method -- having -- usually -- the melt index (the same the following depended on ASTM1238-65T for g / 10 minutes) -- 10-800 -- it is 100-500 preferably.

[0012] The partial saponification object (HEVA) of EVA is obtained by subsequently to a saponification reaction attaching such an EVA raw material.

[0013] here -- the rate of saponification of EVA -- usually -- 3-30-mol % -- it is 5-20-mol % preferably. A saponification reaction is performed by the system which consists of low-boiling point alcohol, such as a methanol and ethanol, and alkali, such as a sodium hydroxide, a potassium hydroxide, and sodium methylate, that what is necessary is just to carry out by the well-known approach conventionally.

[0014] Subsequently, the acid denaturation object (HEVA-C) which has a carboxyl group is acquired using the partial saponification object (HEVA) of such an ethylene vinyl acetate copolymer. As an approach of carrying out acid denaturation of the HEVA, there are an approach of using a graft reaction, and a method of using an esterification reaction.

[0015] When using a graft reaction first, unsaturated carboxylic acid is made to react to HEVA. As such unsaturated carboxylic acid, although partial saturation dicarboxylic acid (or the anhydride), such as partial saturation monocarboxylic acid, such as an acrylic acid, a methacrylic acid, a crotonic acid, and an itaconic acid, and a maleic acid, can be mentioned, for example, an acrylic acid is usually used.

[0016] What is necessary is just to perform a graft reaction to the bottom of the usual reaction condition using radical initiators, such as a benzoyl peroxide, lauroyl peroxide, alpha, and alpha'-azobisisobutyronitril.

[0017] Unsaturated carboxylic acid is preferably used at 0.5 - 5% of the weight of a rate 0.1 to 15% of the weight to HEVA weight. the modified resin which has the carboxyl group obtained by such reaction -- usually -- the acid number -- 0.1-40 -- it is 0.5-15 preferably.

[0018] Moreover, when using an esterification reaction, a dicarboxylic acid anhydride is made to react to HEVA under the usual reaction condition. As such a dicarboxylic acid anhydride, a maleic anhydride, a succinic anhydride, a phthalic anhydride, an anhydrous hexahydro FUTARU acid, etc. can be mentioned, for example. the amount of the dicarboxylic acid anhydride used -- HEVA and 5-80-mol% of the hydroxyl group in the acid denaturation object (HEVA-C) -- it is a complement esterifying 10-50-mol % preferably. the modified resin which has the carboxyl group obtained by such esterification reaction -- usually -- the acid number -- 0.1-20 -- it is 0.5-15 preferably.

[0019] The partial saponification object (HEVA) and its acid denaturation object (HEVA-C) of the above-mentioned ethylene vinyl acetate copolymer are independent, or they are used by two or more sorts, mixing. Moreover, especially among these HEVA(s) and HEVA-C, HEVA-C is used suitably.

[0020] Generally, rosin is thermoplastics which uses an abietic acid as a principal component, and there are gum rosin, wood rosin, tall oil rosin, etc. in this.

[0021] As rosin used for this invention, denaturation rosin, such as hydrogenation rosin (a dihydroabietic acid, tetrahydro abietic acid), disproportionation rosin, disproportionation hydrogenation rosin, and polymerization rosin (polymerization rosin is included in part), rosin or the alkyl ester of denaturation rosin, glycol ester, glycerol ester, pentaerythritol ester, etc. are raised in addition to the above.

[0022] The above-mentioned rosin is independent, or it is used by two or more sorts, mixing.

[0023] Moreover, as the above-mentioned higher-fatty-acid amide, the thing of the carbon numbers 10-50, such as octadecanamide, a palmitic-acid amide, oleic amide, an erucic-acid amide, a lauric-acid amide, methylenebisstearamide, and ethylene-bis-stearamide, is raised, for example.

[0024] Two or more kinds may use a higher-fatty-acid amide, mixing.

[0025] A wax can be used together in the above-mentioned higher-fatty-acid amide.

[0026] Here, as a wax, a micro crystallin wax, paraffin wax (140 degrees F, 145 degrees F, 150 degrees F, 155 degrees F), a montan wax, carnauba wax, oxidization polyethylene wax, a montan wax derivative, a stearin acid sorbitol, oxidization micro wax, a synthetic oxidization wax, a castor wax, beeswax, haze wax, etc. are used, for example.

[0027] As for such a wax, it is desirable to use a thing with a melting point of 60 degrees C or more. It is because stickiness will arise after coat formation if it is the wax of a low-melt point point. If the melting

point of a wax is 60 degrees C or more, in a summer, stickiness will not arise on the front face of fin material.

[0028] In addition, to sensible-heat adhesive property resin, in order to prevent the so-called blocking, depending on the case, thermoplastics other than the above-mentioned resin may be blended.

[0029] As such thermoplastics, there are polyethylene, an ethylene-vinylacetate copolymer, an ethylene acrylic-acid copolymer, an ethylene acrylic ester copolymer, an ionomer, etc., and especially an ionomer is used suitably.

[0030] The addition of these thermoplastics needs to carry out to less than 50% of the weight of the amount of HEVA or (reaching) HEVA-C.

[0031] Moreover, in addition to this, optimum dose use of the tackifiers, such as terpene resin and petroleum resin (aliphatic series, aromatic series, alicycle group), may be carried out at the above-mentioned sensible-heat adhesives.

[0032] Although the sensible-heat adhesives layer which contains a higher-fatty-acid amide in one side of a metallic foil is prepared in the above the sensible-heat adhesive property resin 50 with which a sensible-heat adhesives layer uses HEVA or (and) HEVA-C as a principal component here - 98 weight sections -- with 60 - 97 weight section preferably They are rosin 1 - 40 weight sections, and the thing that contains 0.3 - 10 weight section as preferably [it is desirable and] as 3 - 38 weight section, and the higher-fatty-acid amide 0.1 - 10 weight sections.

[0033] HEVA or (reaching) HEVA-C exceeds 98 weight sections, and when rosin is under 1 weight sections, the exfoliation force committed by internal pressure rise of a seal object to a heat-sealing side when there are too few amounts of rosin and contents are filled up with and sealed in a container cannot be borne here, and it is not desirable.

[0034] Moreover, since there are too many amounts of rosin conversely when rosin exceeds [HEVA or (reaching) HEVA-C] 40 weight sections under 50 weight sections, blocking of sensible-heat adhesives becomes intense and is not desirable.

[0035] Moreover, when the content of a higher-fatty-acid amide is under 1 weight section, there are too few amounts of a higher-fatty-acid amide, and there is no prevention effectiveness of blocking and it is not desirable.

[0036] Moreover, conversely, when the content of a higher-fatty-acid amide exceeds 10 weight sections, since it does not have an adhesive property originally and the adhesive strength of the sensible-heat adhesives layer which the adhesive property of sensible-heat adhesives layer original falls, or minds a higher-fatty-acid amide coating layer, and the container for a seal package declines, a higher-fatty-acid amide is not desirable.

[0037] In addition, a middle resin layer may be made to intervene between a sensible-heat adhesives layer and a metallic foil if needed. Because, a plastic envelope may be inferior in the smooth nature of heat jointing by the shaping approach, and in case the paper cup of a polyethylene coat etc. is fabricated by the cup from the paper board, it is desirable [a paper cup etc.] for the level difference of the joint to become large and to prepare middle resin layers, such as a polyethylene layer, as a cushion layer in such a case.

[0038] As a middle resin layer, that adhesion with a sensible-heat adhesives layer is good uses ethylene copolymer resin like the polyethylene and ethylene-vinyl acetate copolymer resin required. Moreover, as for the thickness of a middle resin layer, it is desirable to be referred to as about 10-50 micrometers from the purpose which conquers the irregularity of a sensible-heat adhesives layer and a level difference. While the cushioning properties at the time of heat sealing improve by such middle resin layer, the corrosion of the metallic foil by contents, such as a dressing and mustard, can be prevented.

[0039] moreover, a metallic foil -- on the other hand -- being alike -- usually required printing is performed and a corrosion prevention coat layer is further prepared on the surface of this.

[0040] The lid material which consists of a metallic foil and a sensible-heat adhesives layer is continuously pierced in the configuration and magnitude which cover the regio oralis of the make container made of synthetic resin, and is fabricated.

[0041]

[Function] In the above, it is in the condition which filled up the container with contents, and if a seal package is carried out by the heat seal lid material of this invention, the exfoliation force committed by internal pressure rise of a seal object to a heat-sealing side could be borne enough, and it has the outstanding sealing performance, and moreover, at the time of opening, it is the moderate force and has [it could tear off easily and] both the functions of sealing performance and easy PIRU nature.

[0042] Drawing 1 and drawing 2 show the example of the lid material by this invention.

[0043] The lid material first shown in drawing 1 is aluminium foil (1). Sensible-heat adhesives layer which contains a higher-fatty-acid amide in one side (2) Adhesives layer (3) It minds, and it is prepared and is made to exist in a higher-fatty-acid amide by the field which should carry out heat adhesion with the regio oralis (10) of containers for a seal package, such as a container which consists of polyethylene coat paper, or a container made of synthetic resin. aluminium foil (1) on the other hand -- being alike -- corrosion prevention coat layer (4) It is given.

[0044] Moreover, although the lid material shown in drawing 2 is the same as that of the configuration of the lid material of drawing 1 almost Aluminium foil by contents (1) It is aluminium foil (1) in order to prevent corrosion. Middle resin layer which becomes one side from a polyethylene film (5) It is prepared. sensible-heat adhesives layer (2) which contains a higher-fatty-acid amide in this middle resin layer (5) it is applied without minding an adhesives layer with a gravure coat etc., and prepares -- having -- moreover, aluminium foil (1) on the other hand -- alike -- corrosion prevention coat layer (4) It is prepared.

[0045]

[Example] Below, the example of this invention is explained with the example of a comparison.

[0046] aluminium foil (1) with a thickness of 35 micrometers which has a corrosion prevention coat layer (4) on one side when an example 1 - 3 drawing 2 are referred to Middle resin layer (5) which consists of polyethylene after are alike on the other hand and preparing the anchor coat layer of a titanium coupling agent It extruded and the laminating was carried out to the thickness of 20 micrometers with the coat. Sensible-heat adhesives layer which furthermore mixed the rosin and higher-fatty-acid amide of various loadings to sensible-heat adhesive property resin on it (2) It is solid content 4 g/m² by the gravure coat. It applied to thickness and three kinds of heat seal lid material was built.

[0047] Here, as sensible-heat adhesive property resin, what carried out distributed mixing of the 5 % of the weight of the calcium carbonates with a mean particle diameter of about 1 micrometer at homogeneity was used for 10% toluene solution of 10% partial saponification object of the ethylene vinyl acetate copolymer [Eve FREX EV-250 (the Mitsui DEYUPON poly chemical incorporated company make)] of 28% of vinyl acetate contents in the examples 1 and 2.

[0048] In the example 3, what carried out distributed mixing of the 5 % of the weight of the calcium carbonates with a mean particle diameter of about 1 micrometer at homogeneity was used for 10% toluene solution of the denaturation object acquired by carrying out the graft polymerization of the acrylic acid to 10% partial saponification object of the ethylene vinyl acetate copolymer [Eve FREX EV-250 (the Mitsui DEYUPON poly chemical incorporated company make)] of the 28% of the above-mentioned vinyl acetate contents 1%.

[0049] Moreover, as rosin, in any case, as a higher-fatty-acid amide, octadecanamide was used for KR-610 (the Arakawa chemical-industry incorporated company make) in the examples 1 and 2, respectively, and it used octadecanamide and paraffin wax together in the example 3.

[0050] Thus, with the dieing out press, the obtained various lid material was pierced in the predetermined configuration and the magnitude corresponding to the regio oralis (10) of the container which consists of polyethylene coat paper.

[0051] And the seal of these lid material was carried out to the regio oralis (10) of the container which consists of polyethylene coat paper filled up with the 80-degree C jam under 210 degrees C and the condition for 0.8 seconds.

[0052] And in order to evaluate sealing performance and the Peel nature as lid material about the seal container after carrying out a heat seal in this way, the leakage generating number (thing about 100 containers of the same kind) and the peel strength (seal reinforcement) (average at the time of opening ten containers of the same kind, kg / 15mm width of face) of lid material were measured about each seal container, respectively, and it was collectively shown in the following table 1.

[0053] Because of one to example of comparison 3 comparison, it is aluminium foil (1). Although the sensible-heat adhesive property resin which becomes one side from the partial saponification object (HEVA) of the same ethylene vinyl acetate copolymer as the case of the above-mentioned examples 1 and 2 is used as a principal component and rosin is contained Sensible-heat adhesives layer which does not contain octadecanamide (2) Although the sensible-heat adhesive property resin which serves as prepared lid material (example 1 of a comparison) from the partial saponification object (HEVA) of an ethylene vinyl acetate copolymer is used as a principal component and octadecanamide is contained Sensible-heat adhesives layer which does not contain rosin (2) Prepared lid material (example 2 of a comparison), And aluminium foil (1) The sensible-heat adhesive property resin which becomes one side from the ethylene vinyl acetate copolymer (EVA) by which partial saponification is not carried out is used as a principal component.

Sensible-heat adhesives layer containing rosin and octadecanamide (2) The prepared lid material (example 3 of a comparison) is built. Like the case of the above-mentioned examples 1-3 The leakage generating number of the seal container after a heat seal, The peel strength (kg / 15mm width of face) of lid material was measured, respectively, and was collectively shown in the following table 1. In addition, at the example 1 of a comparison, it is a sensible-heat adhesives layer (2). Blocking is intense, rolling up after a coat and a rewinding activity are difficult, and it did not result even in the sealing performance as lid material, and the Peel nature evaluation.

[0054]

[Table 1]

	感熱接着剤層						密封性 個数/100個	剝離強度 (kg/15mm幅)
	感熱接着性樹脂	配合量 (重量部)	ロジン類	配合量 (重量部)	高級脂肪酸アミド	配合量 (重量部)		
実施例1	HEVA	80	KR-610	20	ステアリン酸アミド	3	0	1.3
実施例2	HEVA	70	KR-610	30	ステアリン酸アミド	3	0	1.0
実施例3	HEVA-C	80	KR-610	20	ステアリン酸アミド パラフィンワックス	3 0.3	0	1.2
比較例1	HEVA	80	KR-610	20	---	---	--	--
比較例2	HEVA	100	--	--	ステアリン酸アミド	3	10	1.1
比較例3	EVA	80	KR-610	20	ステアリン酸アミド	3	23	1.6

注(1) HEVA : エチレン-酢酸ビニル共重合体の部分ケン化物

(2) HEVA-C : エチレン-酢酸ビニル共重合体の部分ケン化物の酸変性体

(3) EVA : エチレン-酢酸ビニル共重合体

(4) 感熱接着剤層の配合量は固形分重量部を示す。

Sensible-heat adhesives layer which should carry out heat adhesion with the regio oralis (10) of a container according to the lid material of this invention so that clearly from the above-mentioned table (2) Since the higher-fatty-acid amide is made to contain The container could be borne enough at the exfoliation force committed by internal pressure rise of a seal object to a heat-sealing side when contents are filled up with and sealed, and the leakage generating number about 100 containers after a seal package had the sealing performance excellent in 0. And at the time of opening, the peel strength of lid material is 1.0-1.3kg / 15mm width of face, is moderate force, could be torn off easily, and was equipped with both the functions of sealing performance and easy PIRU nature.

[0055] On the other hand, sensible-heat adhesives layer which does not contain rosin although octadecanamide is contained (2) In the lid material of the established example 2 of a comparison, the peel strength of lid material was 1.1kg / 15mm width of face, although the Peel nature was good, no less than ten pieces had the leakage generating number about 100 containers after a seal package, and sealing performance was what inferior.

[0056] moreover, by the lid material of the example 3 of a comparison used as a principal component, the sensible-heat adhesive property resin with which a sensible-heat adhesives layer consists of an ethylene vinyl acetate copolymer (EVA) by which partial saponification is not carried out Even if contained in the sensible-heat adhesives layer at same rate as the case where rosin and octadecanamide are examples 1, while no less than 23 pieces have the leakage generating number about 100 containers after a seal package and sealing performance is very inferior The peel strength of lid material was what is inferior also to the Peel nature by 1.6kg / 15mm width of face.

[0057]

[Effect of the Invention] The heat seal lid material of the container for a seal package by this invention As mentioned above, the sensible-heat adhesive property resin 50 which uses at least one side as a principal component at one side of a metallic foil among the partial saponification object of an ethylene-vinyl acetate copolymer, and its acid denaturation object - 98 weight sections, It is that in which the sensible-heat adhesives layer containing rosin 1 - 40 weight sections, and the higher-fatty-acid amide 0.1 - 10 weight sections is prepared. According to the lid material of this invention, a container can be borne enough at the exfoliation force committed by internal pressure rise of a seal object to a heat-sealing side when contents are filled up with and sealed, and it has the outstanding sealing performance. Moreover at the time of opening, by the moderate force It could tear off easily, it has both the functions of sealing performance and easy PIRU nature, and the effectiveness of being very convenient is done so.

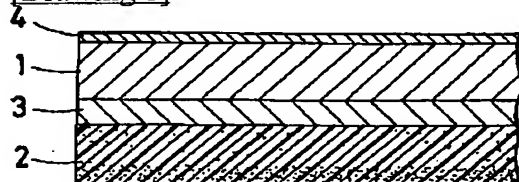
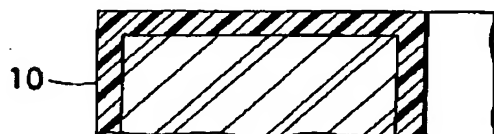
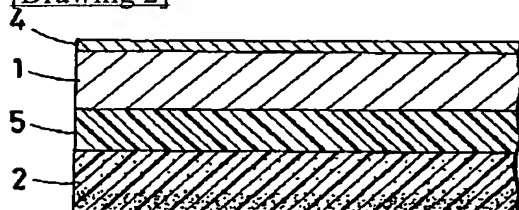
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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
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DRAWINGS

[Drawing 1][Drawing 2]

[Translation done.]